

DIRECT TESTIMONY

of

YASSIR RASHID

Energy Engineering Program

Safety & Reliability Division

Illinois Commerce Commission

Rock Island Clean Line LLC

Petition for an Order granting Rock Island Clean Line LLC a Certificate of Public Convenience and Necessity pursuant to Section 8-406 of the Public Utilities Act as a Transmission Public Utility and to Construct, Operate and Maintain an Electric Transmission Line and Authorizing and Directing Rock Island Rock Island pursuant to Section 8-503 of the Public Utilities Act to Construct an Electric Transmission Line.

Docket No. 12-0560

June 25, 2013

1 **Q. Please state your name and business address.**

2 A. My name is Yassir Rashid. My business address is 527 East Capitol Avenue,
3 Springfield, Illinois 62701.

4 **Q. By whom are you employed and in what capacity?**

5 A. I have been employed by the Illinois Commerce Commission (“ICC” or
6 “Commission”) as an Electrical Engineer in the Energy Engineering Program
7 of the Safety & Reliability Division since September 2008.

8 **Q. What is the function of the Energy Engineering Program of the**
9 **Commission?**

10 A. The Energy Engineering Program’s function is to monitor and review planning
11 and operating practices of Illinois’ regulated utilities as part of the
12 Commission’s responsibilities under the Illinois Public Utilities Act (the “Act”)
13 and to provide information, technical expertise, and recommendations on
14 matters before the Commission through Commission Staff (“Staff”) reports or
15 testimony.

16 **Q. What is your work experience prior to coming to the Commission?**

17 A. Prior to joining Staff, I worked as an Electrical Engineer for three different
18 companies in Sudan from 1994 to 1999.

19 **Q. What is your educational background?**

20 A. I earned a Bachelor of Science in Electrical Engineering with Honors from the
21 University of Khartoum, Sudan in 1994. I earned a Postgraduate Diploma in
22 Business Administration with Merit from the University of Khartoum, Sudan in
23 1997. I earned a Master of Science in Electrical and Computer Engineering

24 from Southern Illinois University Carbondale in 2004.

25 **Q. What is the nature of this proceeding?**

26 A. On October 10, 2012, Rock Island Clean Line LLC ("RICL") filed an
27 application petitioning the Commission for: 1) a Certificate of Public
28 Convenience and Necessity ("CPCN") pursuant to Section 8-406 of the Act to
29 operate as a public utility; 2) a CPCN pursuant to Section 8-406 of the Act to
30 construct, operate, and maintain a new high voltage, direct current ("HVDC")
31 transmission line, and other transmission facilities in Rock Island, Whiteside,
32 Henry, Bureau, LaSalle, and Grundy counties;¹ 3) an authorization pursuant
33 to Section 8-503 of the Act to construct the proposed project; and 4) a request
34 to maintain its books and records at its principal office and that of its ultimate
35 parent company, Clean Line Energy Partners, in Houston, Texas.

36 This proposed HVDC transmission line is part of a transmission line that
37 originates in O'Brien County, Iowa and terminates in Grundy County, Illinois.
38 The total length of the transmission line is approximately 500 miles, 121 miles
39 of which are in Illinois. The transmission line will be designed for a nominal
40 voltage of \pm 600 kilovolt ("kV") direct current ("DC"). This is the first DC
41 transmission line proposed for Illinois. All other transmission lines in Illinois
42 operate using alternating current ("AC"). In Grundy County, RICL will install a
43 converter station to convert the direct current electricity into alternating
44 current electricity as well as a single circuit 345 kV, and a double circuit 345
45 kV AC transmission lines from the converter station to Commonwealth Edison
46 Company's Collins Substation. The converter station is necessary to allow

¹ These counties are listed in RICL Ex. 7.0, pp. 6 – 7.

47 the proposed DC transmission line to connect to the existing AC transmission
48 grid. RICL will also install a 345/765 kV step-up transformer facility to
49 interconnect to Collins Substation.² In my testimony, I will refer to the
50 proposed transmission lines, the proposed converter station, and the
51 proposed interconnection facility as the “proposed project.”

52 **Q. What is the purpose of your Direct Testimony?**

53 A. The purpose of my Direct Testimony is to present my examination of the
54 engineering aspects of the proposed project, as well as the route along which
55 RICL plans to construct the proposed project.

56 **Q. Have you examined the information that RICL provided in its petition?**

57 A. Yes, I have examined RICL petition as well as its witnesses’ direct testimony.
58 I also reviewed pertinent data requests from intervenors and RICL responses
59 to them.

60 **Q. What conclusions have you reached?**

61 A. I have reached the following three conclusions.

- 62 • Although RICL argues that the proposed project will improve the electric
63 system reliability in Illinois,³ RICL has not provided evidence that the
64 reliability of the electric systems in Illinois will be adversely affected if the
65 proposed project is not built. In other words, RICL has not provided
66 evidence that the proposed project is needed to maintain the reliability of
67 the electric systems in Illinois.
- 68 • If the Commission were to grant RICL’s application for a CPCN, I would

² RICL Petition at ¶6.

³ RICL Ex. 6.0, p. 18.

69 have no objection to the route along which RICL proposes to construct the
70 project.

71 • I am skeptical of RICL's ability to efficiently manage and supervise the
72 proposed project.

73 **Q. What criteria did you use to examine RICL's petition for the proposed**
74 **project?**

75 A. I used the criteria included in paragraph (b) of Section 8-406 of the Act, which
76 states, in relevant part:

77 Whenever after a hearing the Commission determines that any
78 new construction or the transaction of any business by a public
79 utility will promote the public convenience and is necessary
80 thereto, it shall have the power to issue certificates of public
81 convenience and necessity. The Commission shall determine
82 that proposed construction will promote the public convenience
83 and necessity only if the utility demonstrates: (1) that the
84 proposed construction is necessary to provide adequate,
85 reliable, and efficient service to its customers and is the
86 least-cost means of satisfying the service needs of its
87 customers or that the proposed construction will promote the
88 development of an effectively competitive electricity market that
89 operates efficiently, is equitable to all customers, and is the
90 least cost means of satisfying those objectives; (2) that the utility
91 is capable of efficiently managing and supervising the
92 construction process and has taken sufficient action to ensure
93 adequate and efficient construction and supervision thereof; and
94 (3) that the utility is capable of financing the proposed
95 construction without significant adverse financial consequences
96 for the utility or its customers. (220 ILCS 5/8-406(b))

97 During the course of my investigation, I examined: (i) whether RICL's
98 construction of the proposed project is necessary to provide adequate,
99 reliable, and efficient service to Illinois ratepayers; (ii) whether constructing
100 the proposed project is the least-cost means for RICL to satisfy the service
101 needs of Illinois ratepayers; and (iii) whether RICL is capable of efficiently

managing and supervising the construction process. Staff witness Richard Zuraski examined whether constructing the proposed transmission line will promote efficient and competitive electricity markets in Illinois, and whether the proposed project will result in economic benefits to Illinois ratepayers. Mr. Zuraski discusses his analysis and conclusions in ICC Staff Exhibit 3.0. RICL petitioned the Commission's approval to maintain its books and records at its principal office and that of its ultimate parent company, Clean Line Energy Partners, in Houston, Texas.⁴ Staff witness Daniel Kahle discusses his conclusions regarding RICL proposed accounting treatment in ICC Staff Exhibit 2.0.

Q. Please describe the facilities that comprise the proposed project.

A. RICL witness Wayne Galli indicated that the proposed project will originate within O'Brien County, Iowa where it will interconnect a 345 kV AC transmission system. The project will run for approximately 500 miles, 121 miles of which is in Illinois, and will interconnect to the existing 765 kV AC transmission system at the Collins Substation within Grundy County, Illinois.⁵ The HVDC portion of the proposed transmission line will have a nominal voltage of ± 600 kV DC and that the proposed project will be capable of delivering 3,500 megawatts ("MW") of power and is expected to deliver approximately 15 million megawatt hours ("MWh") of renewable energy per year to Illinois for delivery into the PJM Interconnection. The HVDC portion of the proposed transmission line will originate from an AC-to-DC converter

⁴ RICL Ex. 10.0, p. 46.

⁵ RICL Ex. 2.0, p. 5.

station at O'Brien County in Iowa and will terminate at a DC-to-AC converter station ("eastern converter station") located approximately four miles north of Collins Substation in Grundy County. RICL will construct three parallel 345 kV AC transmission lines between the eastern converter station and the Collins Substation (a distance of approximately 3 to 4 miles). However, as an alternative to connecting directly into Collins Substation, RICL may construct a new AC substation adjacent to Collins Substation where the voltage will be stepped-up to 765 kV using two or three 345/765 kV transformers for interconnection to the Collins 765 kV bus. The 345 kV AC transmission lines will consist of one single circuit and one double circuit running contiguously. Mr. Galli stated, "if expansion of the existing Collins substation cannot be accommodated, a new AC substation will be needed to house the 345/765 kV transformers."⁶ Mr. Galli indicated that if Collins Substation cannot be expanded then RICL "will acquire land in fee of 20 acres or less adjacent or near to the Collins substation on which to place the new AC substation."⁷

Q. Why are the two converter stations (one on each end of the proposed DC line) necessary?

A. The converter stations are essential for HVDC transmission technology. The energy that is generated in wind farms is in AC form. To be able to transmit this energy over a HVDC transmission line, it must be converted to DC form. In addition, since the energy used domestically is in AC form,⁸ the DC energy that has been transmitted through the HVDC transmission line must be

⁶ *Id.*, p. 6

⁷ *Id.*

⁸ Utilities provide electricity to our homes at 120 volts and 240 volts alternating current.

146 converted back to AC form at the end of the transmission line.

147 **Q. Describe the reasons behind RICL's design to use HVDC technology for**
148 **the proposed project.**

149 A. As Mr. Galli indicated in his direct testimony,⁹ HVDC technology has many
150 advantages over high voltage alternating current ("HVAC") technology
151 concerning transmitting large amounts of electric energy for long distances.
152 Some of these advantages include, lower power losses, less construction
153 cost, and narrower horizontal clearance for the transmission line, which
154 means the DC transmission line can operate safely and reliably inside a
155 narrower Right of Way ("ROW").

156 **Q. In his direct testimony, Mr. Galli stated that RICL plans to "provide open**
157 **access transmission service"**¹⁰ **to the proposed project. In addition, in**
158 **his supplemental direct testimony, RICL witness David Berry stated,**
159 **"Rock Island will be obligated to provide non-discriminatory, open**
160 **access transmission service to all "eligible customers..."**¹¹ **Please**
161 **comment on the aforementioned statements.**

162 A. Although RICL plans to provide open access to the transmission line, I believe
163 this offer is only feasible outside the HVDC portion of the transmission line.
164 Theoretically, interconnection with high voltage alternating current ("HVAC")
165 generators or other transmission lines along the HVDC portion of the project is
166 attainable; however, it requires installation of AC-to-DC and/or DC-to-AC
167 converters at each location where interconnection with the HVDC

⁹ See generally, RICL Ex. 2.0, Section VI.

¹⁰ *Id.*, p. 5.

¹¹ RICL Ex. 10.13,p. 4.

transmission line portion of the proposed project is sought. The addition of these converters will increase the interconnection cost significantly, making such an endeavor impractical and economically infeasible. This economic disadvantage will likely hinder Illinois electricity producers' and electricity users' ability to access the HVDC transmission line. RICL's proposed project is best suited to serve energy producers who access the HVDC transmission line at the west end of the transmission line (O'Brien County, Iowa) and deliver their energy production to consumption centers at the east end of the HVDC transmission line (PJM Interconnection). In that sense, for optimal use of the proposed project, it should be seen as analogous to a one-way highway with no entry or exit ramps that starts in northwestern Iowa and ends in northeastern Illinois.

Q. Do you believe the proposed project is necessary to provide adequate, reliable, and efficient service to Illinois ratepayers?

A. No, not from an electric service reliability standpoint. RICL does not argue that its proposed project is needed nor it is necessary to maintain the reliability of the electric system in Illinois. However, RICL's main argument for the proposed project is that it will promote the development of competitive electricity markets, which will reduce the cost of electricity in Illinois; and that it is needed to help meet certain renewable portfolio standards policies. Staff witness Zuraski addresses the economic aspects of the proposed project in ICC Staff Ex. 3.0.

Q. Did RICL disclose the cost of the proposed project?

191 A. Yes. In his direct testimony, RICL witness Michael Skelly, indicated that the
192 overall cost of the proposed project is \$2 billion.¹² RICL witness Morris Stover
193 estimates that the cost for constructing the transmission lines (both DC and
194 AC) within Illinois' borders is approximately \$318 million for the preferred
195 routes and approximately \$319 million for the proposed alternative routes. Mr.
196 Stover's estimates did not include the eastern converter station or the AC
197 interconnection facility.

198 **Q. Do you believe the cost of RICL's proposed project meets the least-cost**
199 **criterion that is defined in Section 8-406 of the Act?**

200 A Since RICL does not propose alternatives to the proposed project, it is not
201 clear whether the proposed project, which RICL estimates will cost \$2 billion
202 overall, is the least-cost project that would further the cause that RICL
203 identifies for implementing the proposed project.

204 **Q. Is it likely that some alternative like an AC transmission line of equal**
205 **load capacity would be less costly than RICL's proposed project?**

206 A. I do not know. I simply do not have the information necessary to identify an
207 alternative transmission project that would potentially move 3,500 MW of wind
208 energy from O'Brien County, Iowa to the Collins Substation in Grundy County.
209 RICL should address this issue in its rebuttal testimony.

210 **Q. Please describe the proposed project's engineering specifications as**
211 **well as its layout and facilities.**

212 A. In its petition, RICL indicated that the proposed project would be rated at \pm
213 600 kV DC, which may be as high as \pm 640 kV to \pm 660 kV DC, based on the

¹² RICL Ex. 1.0, p. 33.

214 final design of the proposed project.¹³ Mr. Galli testified that RICL will utilize a
215 bipolar design¹⁴ for the project.¹⁵ Because of the polarity nature of DC
216 voltage, the potential difference (the DC voltage) between the two poles will
217 be 1,200 kV. Mr. Galli testified that the proposed project could operate in a
218 monopolar mode in case one of the two poles is not available.¹⁶ In addition,
219 Mr. Galli stated the proposed transmission line “will be capable of delivering
220 3,500 megawatts (“MW”) of power and is expected to deliver approximately 15
221 million megawatt hours (“MWh”) of renewable energy per year to Illinois for
222 delivery into the PJM Interconnection.”¹⁷
223 In his direct testimony, Mr. Galli provided information regarding the structures
224 that RICL intended to use for the transmission line and the ROW that RICL
225 would need for the transmission line.¹⁸ Mr. Galli stated, “two primary structure
226 types have been identified: lattice structures and tubular steel “monopole”
227 structures.”¹⁹ Mr. Galli also added, “Rock Island has not made a
228 determination as to the final structure type but would like to have flexibility in
229 such a determination so that landowner concerns, project costs, terrain, land
230 use, and other relevant factors can be considered when making a final
231 selection. It is likely that a mix of structures could be utilized to help maximize

¹³ RICL Petition, at ¶6.

¹⁴ A bipolar design utilizes two poles for the transmission line. Here a pole means a conductor through which energy transmits. In AC transmission, conductors through which energy transmits are called phases. In DC transmission, the conductors are called poles. Used in this context, pole is best defined as either of the two terminals of an electric cell, battery, generator, or motor.

¹⁵ RICL Ex. 2.0, p. 24.

¹⁶ *Id.*, p. 25.

¹⁷ *Id.*, p. 5.

¹⁸ *Id.*, generally at pp. 27 – 32.

¹⁹ *Id.*, p. 27.

flexibility and optimize costs.”²⁰ Mr. Galli attached schematic diagrams for the tower designs to his testimony as RICL Exhibit 2.9.

On May 31, 2013, RICL filed an Agricultural Impact Mitigation Agreement (“agreement”) that it negotiated with Illinois Department of Agriculture and labeled it as RICL Exhibit 7.28. One of the issues that the agreement addressed was RICL’s potential use of the lattice tower structure design, which requires a larger base than the monopole structure design. Paragraph 3 of the “Construction Standards and Policies” section of the agreement states:

Tangent structures (straight-line, non-turning structures) will utilize only single, drilled pier type concrete foundations or direct embed type foundations that are typical of single pole type structures. Clean Line will not utilize multi-foundation lattice type structures for tangent structures, though such structures may be used for turns, long spans such as river crossings, and similar situations where specific engineering and environmental challenges are present.

The use of guy wires will be avoided to the extent feasible. If guy wires are required, they will be marked with highly visible guards.

Along with the agreement, RICL filed a revised version of RICL Exhibit 2.9, in which it added technical specifications of a new monopole structure design that the agreement specifies.

Mr. Galli stated: “The current designs allow for 1500-foot spans for lattice towers and 1200-foot spans for tubular steel monopoles.”²¹ Mr. Galli indicated that poles heights would be between 100 feet and 175 feet depending on the location of each pole.

²⁰ *Id.*, pp. 27 – 28.

²¹ *Id.*, p. 28.

259 RICL requests a 200 feet ROW for the HVDC portion of the transmission line
260 and 270 feet for the HVAC portion of the transmission line.²²

261 **Q. Do you have any issues with the information that RICL has provided for**
262 **the DC transmission line structures?**

263 A. Yes. I request that RICL provide updated information in its rebuttal testimony
264 about pole placement given the shorter span lengths required by monopole
265 structures.

266 **Q. Please describe the route selection process that RICL followed to select**
267 **the preferred routes and the proposed alternative routes for the**
268 **proposed project.**

269 A. The proposed project extends for approximately 121 mile in Illinois from a
270 point where it crosses the Mississippi River in Rock Island County to Collins
271 Substation in Grundy County. In his direct testimony, RICL witness Hans
272 Detweiler indicated that RICL retained environmental professionals, public
273 involvement specialists, and engineers from HDR Engineering, Inc., POWER
274 Engineers, Inc., and Kiewit Power Constructors Co., and RICL to form the
275 Routing Team that performed the routing analysis.²³ In his direct testimony,
276 RICL witness Matthew Koch indicated that the preferred route and the
277 proposed alternative route for the HVDC portion of the transmission line were
278 developed separately from the preferred route and the proposed alternative
279 route for the HVAC portion of the transmission line.²⁴ Mr. Detweiler explained
280 the criteria that RICL used to select the routes for the proposed project. The

²² *Id.*, pp. 29-30.

²³ RICL Ex. 7.0, p. 6.

²⁴ RICL Ex. 8.0, p. 5.

281 main elements of the routing criteria that RICL used to develop the routes
282 were sensitivities, opportunities, and technical guidelines. Mr. Detweiler
283 stated that sensitivities refer to “[resources] or conditions that can potentially
284 limit transmission line development and may include areas restricted by
285 regulations, or where impacts to these resources would be very difficult or
286 impractical to mitigate.”²⁵ Mr. Detweiler stated that opportunities refer to “[pre-
287 existing] linear infrastructure or features (e.g., existing linear corridors such as
288 roads or transmission lines...) along which transmission line development is
289 potentially compatible and where impacts to Sensitivities may be reduced by
290 following these features.”²⁶ Mr. Detweiler also stated that technical guidelines
291 refer to “[the] specific engineering requirements and objectives associated
292 with the construction of the project[,]” such as maintaining at least 200 feet of
293 separation between centerlines when paralleling other electric transmission
294 lines of 345 kV or above, or the requirement to minimize the overall length of
295 the line. RICL developed the Routing Study that it used to select a preferred
296 and proposed alternative routes for the HVDC and the HVAC portions of the
297 proposed transmission line.²⁷ As a result of the Routing Study, RICL selected
298 Study Route A and Study Route B as preferred and proposed alternative
299 routes for the HVDC portion; and Study Route F and Study Route G as
300 preferred and proposed alternative routes for the HVAC portion for the
301 proposed project respectively. Mr. Detweiler attached to his direct testimony
302 maps of the four aforementioned routes as Rock Island Exhibit 7.1. He also

²⁵ RICL Ex. 7.0, p. 10.

²⁶ *Id.*

²⁷ RICL included the Routing Study as RICL Ex. 8.2.

303 attached legal descriptions of the aforementioned routes as Rock Island
304 Exhibit 7.2.

305 **Q. Are there other facilities, in addition to the DC and AC transmission**
306 **lines, that are necessary for the proposed project, and must RICL select**
307 **locations for those facilities?**

308 A. Yes. RICL needs to acquire land, on which it can construct the eastern
309 converter station. Mr. Detweiler indicated that RICL is in the process of
310 acquiring land in Grundy County at the proposed location for the eastern
311 converter station.²⁸ Mr. Detweiler also indicated that RICL is also negotiating
312 the purchase of a parcel in Kendall County north of the proposed location for
313 the eastern converter station “in case the Grundy County location proves
314 unsuitable for any reason.”²⁹

315 According to Mr. Galli, RICL may need to “acquire land in fee of 20 acres or
316 less adjacent to Collins substation” to house three 345/765 kV AC
317 transformers, if the Collins Substation cannot be expanded to house the three
318 transformers.³⁰

319 **Q. Do you have reservations over the route selection procedure and**
320 **process, or over the preferred and proposed alternative routes?**

321 A. No. After reviewing Mr. Detweiler’s and Mr. Koch’s direct testimony and the
322 exhibits attached to them, including the Routing Study, I have no reservations
323 concerning RICL’s process or procedure concerning the route selection. In
324 addition, if the Commission were to approve RICL petition, I would have no

²⁸ RICL Ex. 7.0, p. 9.

²⁹ *Id.*

³⁰ RICL Ex. 2.0, p. 6.

325 objection to the preferred or the proposed alternative routes that RICL
326 identifies in its filing.

327 **Q. Do you believe that RICL is capable of efficiently managing and**
328 **supervising the construction of the proposed project?**

329 A. No. In his direct testimony, RICL witness Morris Stover indicated that Kiewit
330 Power Constructors Co (“KPC”) would provide engineering, procurement, and
331 construction services to RICL (“EPC”).³¹ Mr. Stover described KPC
332 qualifications to execute a full EPC contract. Mr. Stover listed some of the
333 transmission projects in which KPC was recently involved. In addition, Mr.
334 Stover outlined the sequence of design and construction activities for the
335 proposed project.³² Based on the testimony that Mr. Stover provides, and the
336 KPC’s reputation as one of the larger construction organizations, it appears
337 that KPC is capable of handling EPC for the proposed project. However,
338 RICL has provided no evidence that it, as an entity, or its parent company
339 have ever managed or supervised a transmission line project, let alone a
340 transmission line project of this magnitude. Therefore, I am skeptical of
341 RICL’s ability to efficiently manage and supervise the proposed project. I
342 recommend that RICL provide information in its rebuttal testimony on its
343 capability to efficiently manage and supervise the construction of the
344 proposed project.

345 **Q. Does that conclude your prepared Direct Testimony?**

346 A. Yes, it does.

³¹ RICL Ex. 9.0, p. 2.

³² RICL Ex. 9.0, pp. 3 – 8.